

Promoting Sustainable Development in Dairy

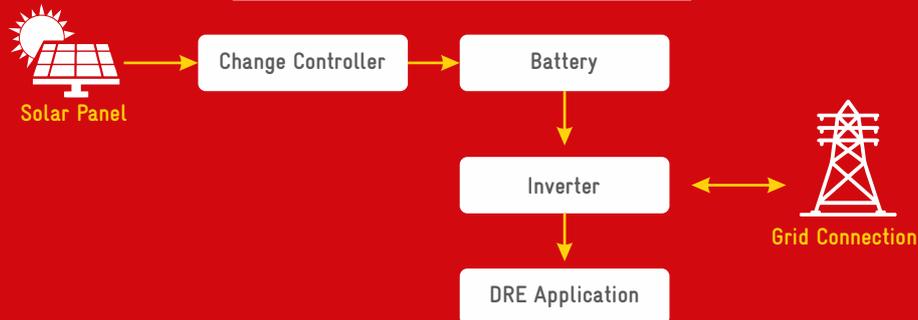
through Decentralised
Renewable Energy (DRE)



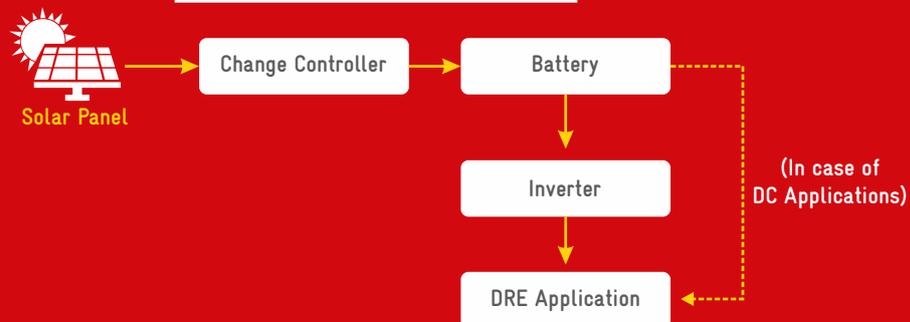
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Types of Solar Energy System

Grid connected solar energy system



Off-grid solar energy system



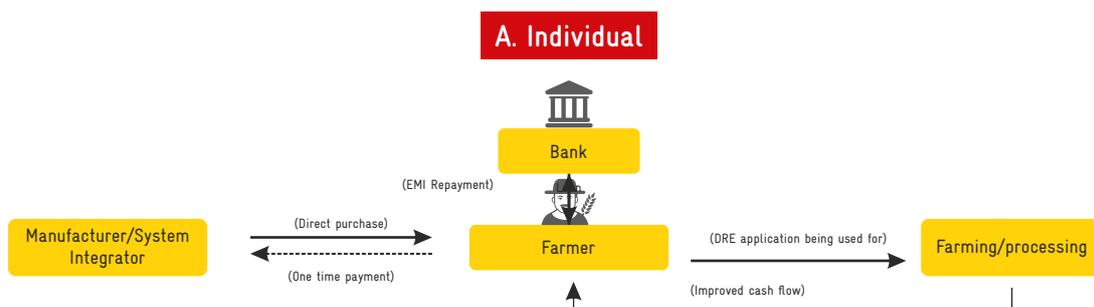
Implementing DRE solutions can provide sustainable and reliable energy sources for dairy operations for small and marginal farmers. DRE reduces dependence on traditional energy sources, lowers costs, and mitigates environmental impact, making it crucial for enhancing the sustainability and profitability of the dairy sector.

DRE Applications in Dairy Sector



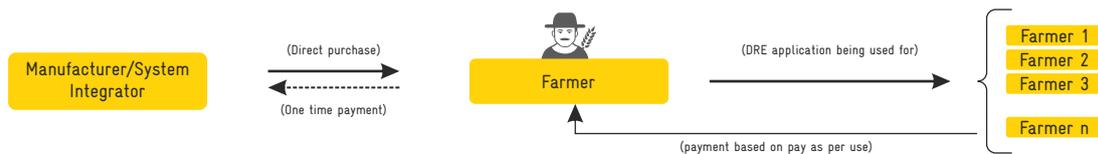
	Size	Types	Price	Stage of Vendor Chain
Solar Pump Sub HP 	0.1 – 0.75 HP	Surface and Submersible AC/DC	10,000 – 47,000	Production
Solar Milking Machine 	0.2 – 5 HP	Single or Double cluster AC/DC	68,000 – 4,95,000	Milking
Solar Bulk Milk Chillers 	100 – 3000 litres	Direct expansion mechanism and Thermal Energy storage mechanism	3,50,000 – 16,00,000	Collection/Storage
Solar Milk Cream Separator 	60 – 500 litres	Available with different heating system such as solar concentrators, LPG etc.	1,38,000 – 1,95,000	Processing
Solar Khoya Making Machine 	55 – 300 litres	Available with different heating system such as solar concentrators, LPG etc.	2,47,000 – 4,75,000	Storage
Solar Refrigerators cum Freezers 	95 – 550 litres	AC/DC	56,000 – 2,97,000	

Possible Business Models



Schematic diagram for direct purchase model

B. Pay As You Go



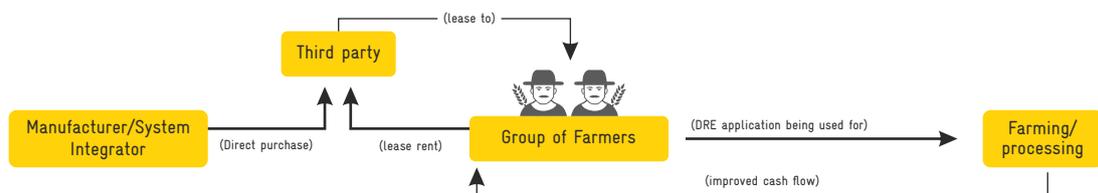
Schematic diagram for Pay As You Go model

C. Shared ownership



Schematic diagram for shared ownership model

D. Lease model



Schematic diagram for lease model

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Programme/project description
Indo German Energy Programme – Promotion of Solar Water Pumps (IGEN-PSWP)

Responsible
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Content Review
Anuj Hemant Xess, Energy Advisor, IGEN-PSWP, GIZ India

Design/Illustration
Vibhooti Impact

On behalf of
German Federal Ministry for Economic Cooperation and Development (BMZ)
New Delhi, May 2023

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Promoting Sustainable Development in Fishery

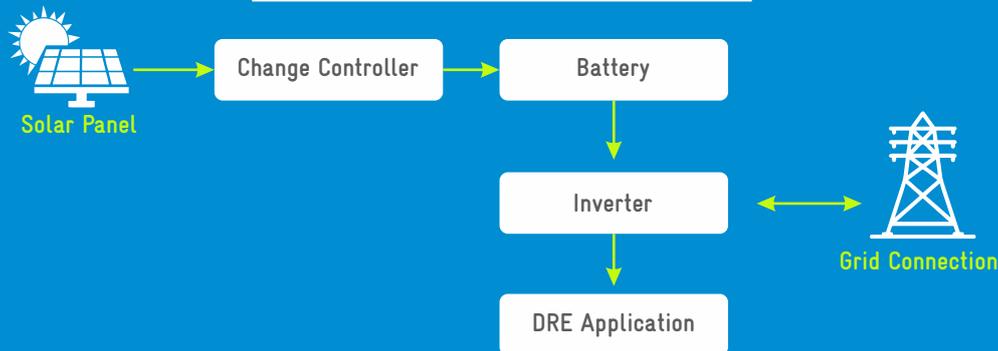
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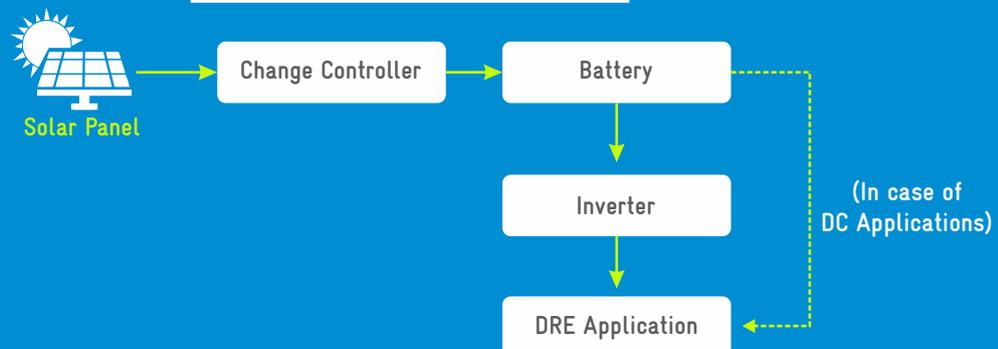
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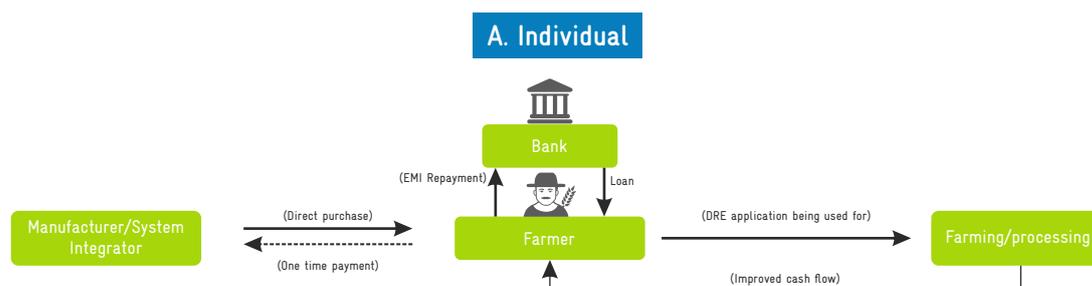
Decentralized Renewable Energy applications are crucial for the fishery sector, particularly for small-scale fishers. These technologies, like solar water aerators, refrigeration etc., offer reliable and environmentally-friendly energy solutions. By adopting decentralized renewables, fishers can reduce their dependence on fossil fuels, lower operational costs, and minimize greenhouse gas emissions. Additionally, these applications can enhance fishery productivity, support sustainable aquaculture practices, and contribute to the growth of inland farming, ultimately benefiting small-scale fishers.

DRE Applications in Fishery Sector



	Size	Types	Price	Stage of Vendor Chain
Solar water aerator 	1 - 5 HP	Paddle wheel aerator, Pump-sprayer aerators, Vertical pump aerators, Diffusers or bubblers	2,80,000 – 5,55,000	Production
Solar Fish Meat mincing machine 	1.5 - 5 HP (150 – 200 kg/hour)	Mechanical/ Pneumatic	5,00,000 – 11,00,000	Processing
Solar Fish De-boning machine 	2 HP (180 kg/hour)	Single or multi type	6,00,000 – 7,00,000	Processing
Solar Pump Sub HP 	0.1 – 0.75 HP	Surface and Submersible	10,000 - 47,000	Production
Solar Pump 	1 - 7.5 HP	Surface and Submersible	70,000 – 5,00,000	Production
Solar Dryer 	2.5 – 1050 kg/batch	Tray, Cabinet, Tunnel, Hybrid	18,000 - 24,00,000	Processing
Solar Refrigerators cum Freezers 	95 -550 litres	AC/DC	56,000 – 2,97,000	Post Harvesting

Possible Business Models



Schematic diagram for direct purchase model

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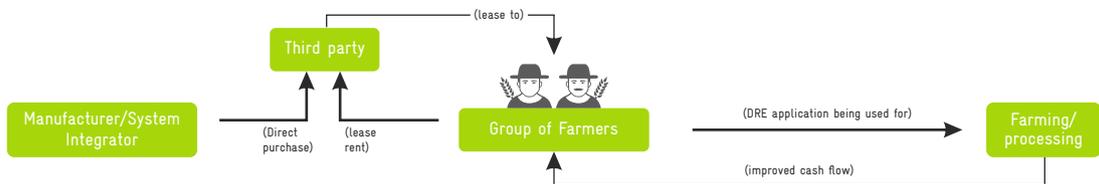
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Promoting Sustainable Development in Agriculture

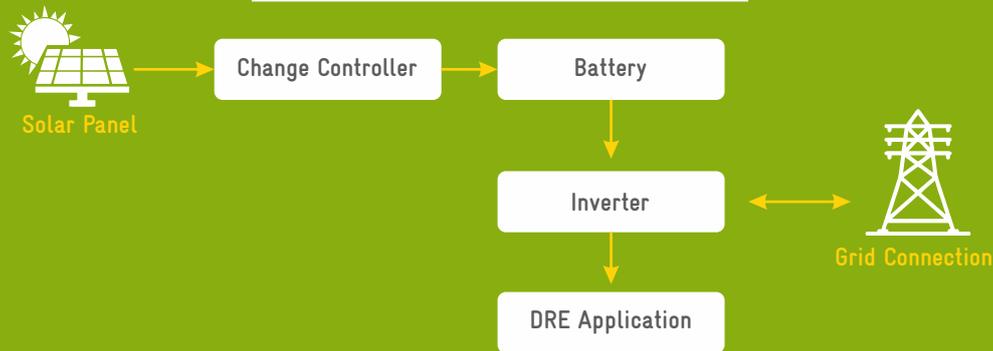
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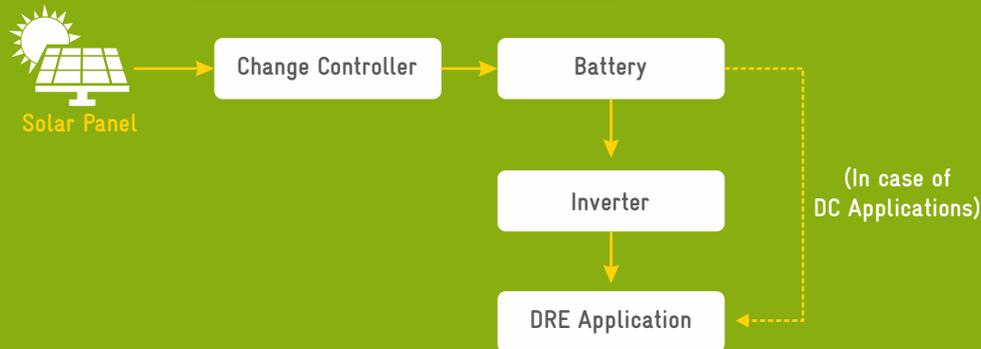
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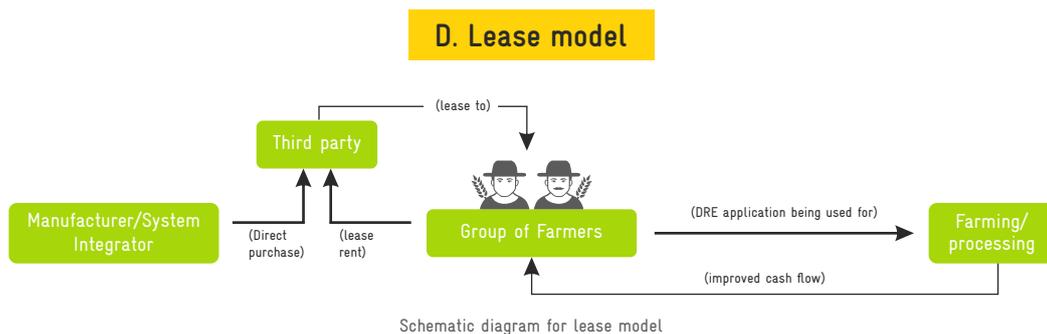
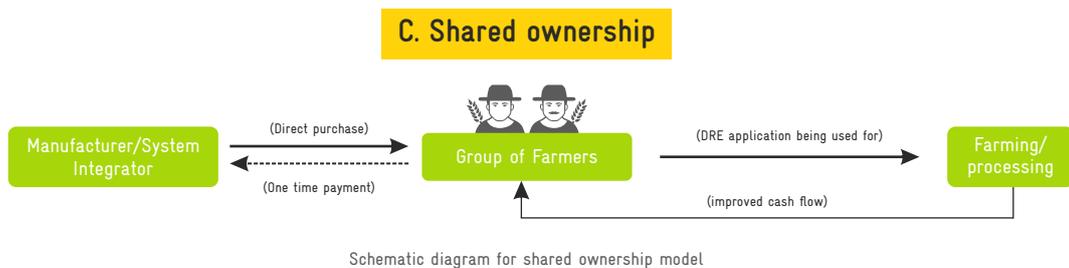
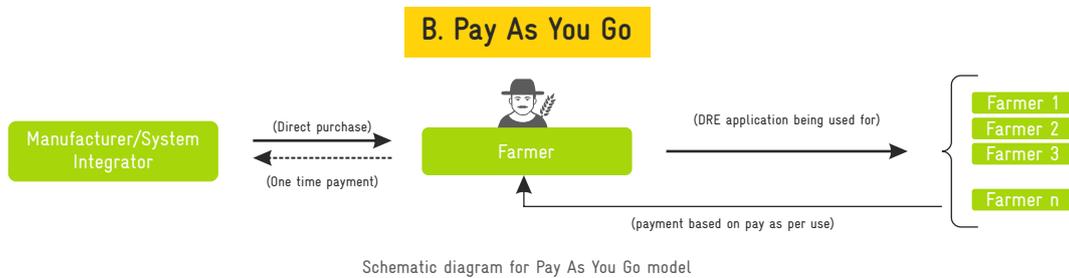
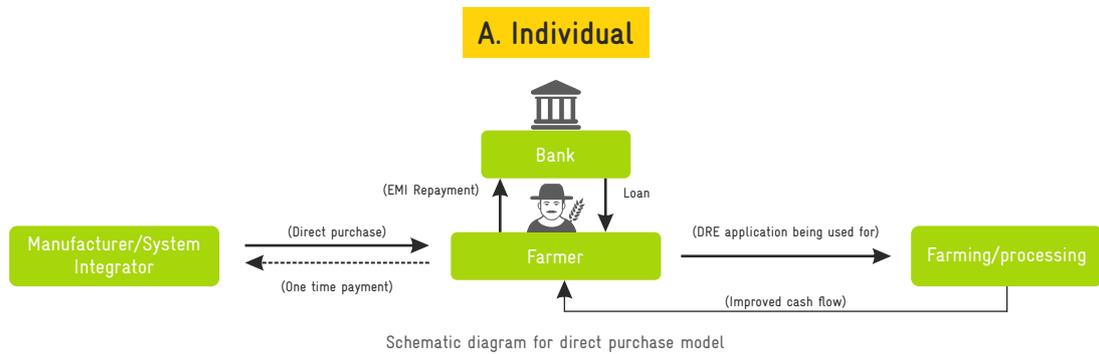
Decentralized renewable applications are essential for small and marginal farmers in the agricultural sector. These technologies, such as solar-powered irrigation systems and processing units, provide reliable and affordable energy sources in rural areas with limited access to the grid. By utilizing decentralized renewables, farmers can improve water management, enhance productivity, reduce reliance on fossil fuels, and mitigate climate change impacts, thereby promoting sustainable agriculture and improving livelihoods for small and marginal farmers.

DRE Applications in Agriculture Sector



		Size	Types	Price	Stage of Vendor Chain
Solar Water Pump		1 - 7.5 HP	Surface and Submersible	70,000 - 5,00,000	Production
Solar Cold Storage		2 - 10 MT	Direct expansion and Thermal Energy storage	7,00,000 - 16,00,000	Post Harvesting
Solar Rice Milling Machine		3-5 HP	Huller only and Huller + Polisher (+ Grader)	8,00,000 - 12,00,000	Processing
Solar Oil Expeller		15-40 kg/hour	Screw and Hydraulic Press	3,40,000 - 13,00,000	Processing
Solar Dryer		2.5 - 1050 kg	Tray, Cabinet, Tunnel, Hybrid	18,000 - 24,00,000	Processing
Solar Pulveriser		25 - 100 kg/hour	Stone based, Blade and Hammer based	8,00,000	Processing
Solar Juicing and Pulping machine		50-350 kg/hour	Pulper and Juicer (with and without heater)	2,77,000 - 10,00,000	Processing
Solar Flour Mil		2- 5 HP	Stone based, blade and hammer based	5,66,000 - 11,00,000	Processing
Solar Cotton Weaving Machine		40-150 picks/ min.	Fixed, Portable, Semi Portable	2,40,000	Processing
Solar Millet Processing Machine		0.5 -3 HP	Abrasive, Rubber, Disc, Impact	3,10,000 - 8,67,000	Processing
Solar Dal processing unit		60 - 200 kg/hour	Vertical and Horizontal	9,00,000 - 10,00,000	Processing
Solar Refrigerators cum Freezers		95 - 550 litres	AC/DC	56,000 - 2,97,000	Post Harvesting

Possible Business Models



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